



CERTIFICATE

I, Thomas Kitzhofer, of Manzingerweg 7, 81241 München, Germany, declare that I am conversant with the German and English languages, and that to the best of my knowledge and belief the accompanying text is a true translation of the priority document issued by the German Patent and Trademark Office on 19 September 2003, for Serial No. 202 16 754.2.

Signed this 20th day of February 2006

A handwritten signature in cursive script, appearing to read "Kitzhofer", written over a horizontal line.

Certified Translation

FEDERAL REPUBLIC OF GERMANY

(coat of arms)

**Certificate of Priority Relating to the Filing
of a Utility Model Application**

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Filing Date: 30 October 2002

Applicant/Owner: TRW Automotive Safety Systems GmbH,
Aschaffenburg/Germany

Title: Gas Bag Module and Vehicle Steering Wheel
with a Gas Bag Module

IPC: B 60 R 21/16

**The attached documents are a correct and true copy of the original documents of
this utility model application.**

[seal of the
German Patent
and Trademark
Office]

Munich, dated 19 September 2003
German Patent and Trademark Office
The President
By:

(signature)

Brosig

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Gas Bag Module and Vehicle Steering Wheel with a Gas Bag Module

The invention relates to a gas bag module comprising a gas generator and a generator carrier, to which the gas generator is fastened and via which the gas generator can be fastened directly or indirectly to a vehicle steering wheel. The
5 invention further relates to a vehicle steering wheel with such a gas bag module.

It is possible to manufacture generator carriers for fastening the gas generator entirely or partially from plastic.

The invention makes possible a favorably priced manufacture of a gas bag module which is particularly well matched to the requirements set.

10 This is achieved in that the generator carrier consists at least partially of a multiple-component plastic. Thus, various material characteristics of different plastics can be utilized in an optimum manner. For example, through the introduction of an elastic component, in addition to a hard carrier component, a vibration-damping or noise-reducing effect (the latter to avoid rattling noises) can
15 be achieved in a simple and favorably-priced manner.

The multiple-component sections are preferably realized from a carrier material and a softer coating applied thereon.

Quite generally, a generator carrier having multiple-component sections can also be adapted easily and flexibly to various requirements of different fields of use both as regards geometry and also as regards the vibration damping characteristics.

- 5 Preferably, the generator carrier forms the module housing which receives the gas generator and gas bag, so that an additional component can be dispensed with.

It is possible to form detent elements on the generator carrier, for connection of the gas bag module on the steering wheel side, preferably on a base section of the generator carrier. These detent elements advantageously consist of a multiple-
10 component plastic with an elastic component and a stable carrier component. Through the use of a multiple-component material, both a noise- or vibration-damping and also the necessary high stability can be achieved in a simple manner.

In an advantageous embodiment of the invention, the generator carrier has a cup-shaped form with a depression in which the gas generator is arranged. When
15 the generator carrier forms the module housing, a wall of the depression preferably extends over a greater vertical extent than the generator, so that in addition a gas bag can be arranged in the depression.

It is possible to design the depression such that a covering cap can be inserted into the depression, which closes to the exterior the generator carrier acting as
20 module housing. This allows the gas generator and the gas bag to be arranged in a simple manner in the module housing and to then close the module housing by the covering cap so as to be dust-tight.

In a preferred embodiment of the invention, at least one laterally projecting section is constructed on the edge of the depression. The projecting section can
25 surround the edge of the depression entirely or partially. On the projecting section, switches can be fastened which therefore have an arrangement relative to the covering cap which can be determined with close tolerances. In gas bag modules hitherto, numerous intermediate metal sheets were always provided between the

switch and the covering cap, which caused a great cumulative tolerance and large gaps between switch and covering cap.

5 The gas bag module according to the invention is preferably used in a steering wheel according to the invention, in which the projecting section forms a part of the surface of the steering wheel which is visible from the outside, and advantageously covers a gap formed between the gas bag module and the adjoining steering wheel skeleton encased in foam, which gap impairs the visual appearance of the steering wheel.

10 Preferably, the projecting section consists of a multiple-component plastic, e.g. in the form of a coating on a hard carrier material. The material of the coating is preferably a soft plastic which, depending on the desired purpose of use and appearance, can have a corresponding design and a corresponding tactile feel.

15 The gas bag module can be fastened so as to be movable in axial direction in the steering wheel and can be designed such that through the axial movement, a contact can be closed for actuating a horn. In this case, a generator carrier, the lateral edge of which continues into a visible section of the steering wheel, is particularly advantageous. A pressure onto the projecting section, taking place for actuating the horn, is transferred directly to a contact arranged for example in the region of the detent hooks, which brings about a considerable reduction of
20 tolerances compared with known steering wheels, in which the vertical movement is passed on from the covering cap to the module housing. Furthermore, this results in a reduction in components.

25 Further features and advantages of the invention will be apparent from the following description of an example embodiment in connection with the enclosed drawings, in which:

- Figure 1 shows a diagrammatic section through a gas bag module according to the invention; and

- Figure 2 shows a diagrammatic sectional view of a steering wheel according to the invention.

5 The gas bag module 10 contains a generator carrier 12 which has a cup-shaped form with a depression 14 in which a gas generator 16 and also a folded gas bag 18 (shown diagrammatically) are arranged. The gas generator 16 is fastened in the generator carrier 12 in a suitable known manner. In the example shown here, the module housing is formed entirely by the generator carrier 12. However, it is also possible to arrange the generator carrier in a separate module housing which is fastened to the steering wheel.

10 On a base section 19 of the cup-shaped receptacle 14, detent elements 20 are formed on in one piece, by which the gas bag module 10 can be latched in place on a skeleton 21 of the steering wheel, for example (see Figure 2). The shape and construction of the detent elements 20 can be coordinated by the specialist in the art to the respective purpose of use. Preferably, the steering wheel and the detent
15 elements are constructed such that the gas bag module can be moved in the steering wheel in axial direction for actuating a horn.

The depression 14 can be closed by a covering cap 26 which is pushed into the depression 14 with a press fit. The covering cap 26 is adapted in shape to the cross-section of the cup-shaped receptacle 14 and has a rim which in the state
20 when placed in position projects into the depression 14 and thus fixes the covering cap 14 on the generator carrier 12 for example by means of detent hooks 27 (see Figure 2).

A laterally projecting section 24 which is constructed in one piece with the generator carrier 12 is formed in one piece onto the rim 22 of the receptacle 14.

25 If the module 10 is inserted into a receiving space 110 of a steering wheel 100, as can be seen in Figure 2, the laterally projecting section 24 forms a visible part of the exterior of the hub region of the steering wheel 110. The projecting section 24 is shaped corresponding to the geometry of the steering wheel and has sections running along the spokes. The gap 120 formed between the wall 28 of the cup-

shaped section 14 of the generator carrier 12 and the boundary of the receiving space 110 of the steering wheel 100 on the steering wheel side is covered to the exterior by the projecting section or sections 24.

5 The actuation of the horn takes place for example by pressure onto the laterally projecting section 24, the force being transferred directly onto the horn contacts via the single-piece generator carrier.

The generator carrier 12 consists in part of a two- or multiple-component plastic. In the embodiment shown here, the wall 28 and the base section 19 of the cup-shaped depression 14 are formed from a hard plastic which ensures a high
10 stability, e.g. from a glass fiber-reinforced polyamide-6, from polyethylene (PET), from polyoxymethylene (POM) or from another suitable material. In the detent elements 20 and the projecting section 24 on the other hand such a hard plastic is used as carrier component 30 and coated with a softer plastic 32, e.g. a styrene-based plastic (e.g. SEBS), a thermoplastic urethane (TPU), a thermoplastic olefin
15 or another suitable material.

The material of the coating 32 is selected according to the function which is to be fulfilled. For the coating of detent surfaces 34 of the detent hooks 20, a material is favorable which acts in a noise- and vibration-damping manner. For the coating 32 of the laterally projecting section 24, in turn, a material is
20 advantageous which corresponds in feel, appearance and environmental stability to the desired characteristics for a visible surface of the steering wheel.

The generator carrier 12 forms a single-piece component with the detent hooks 20 and the projecting section or sections 24, the non-coated sections preferably consisting entirely of the carrier component. The coating of the respective parts of
25 the generator carrier 12 preferably consists of a thin layer which can be applied over a large area.

Claims

1. A gas bag module, comprising

a gas generator (16) and

a generator carrier (12), to which the gas generator (16) is fastened and via
5 which the gas generator (16) can be fastened directly or indirectly to a vehicle
steering wheel,

characterized in that the generator carrier (12) consists at least partially of a
multiple-component plastic (30, 32).
2. The gas bag module according to Claim 1, characterized in that detent
10 elements (20) are formed on a base section (19) of the generator carrier (12), by
means of which detent elements the generator carrier (12) can be fastened on the
steering wheel side.
3. The gas bag module according to Claim 2, characterized in that the detent
elements (20) consist at least partially of a multiple-component plastic (30, 32).
- 15 4. The gas bag module according to any of the preceding claims,
characterized in that the multiple-component plastic consists of a carrier material
(30) and a coating (32).
5. The gas bag module according to any of the preceding claims,
characterized in that the generator carrier (12) has a cup-shaped construction with
20 a depression (14) in which the gas generator (16) is arranged.
6. The gas bag module according to Claim 5, characterized in that a covering
cap (26) is provided, which can be inserted into the depression (14), and that the
depression (14) is constructed such that the covering cap (26) closes the generator
carrier externally.

7. The gas bag module according to either of Claims 5 and 6, characterized in that on the edge (22) of the depression (14) at least one laterally projecting section (24) is formed.

5 8. The gas bag module according to Claim 7, characterized in that the projecting section (24) consists of a multiple-component plastic (30, 32).

9. A vehicle steering wheel with a gas bag module according to either of Claims 7 and 8, characterized in that the projecting section (24) forms a part of a surface of the steering wheel (100) which is visible from the exterior.

10 10. The vehicle steering wheel according to Claim 9, characterized in that the gas bag module is mounted so as to be movable in axial direction.

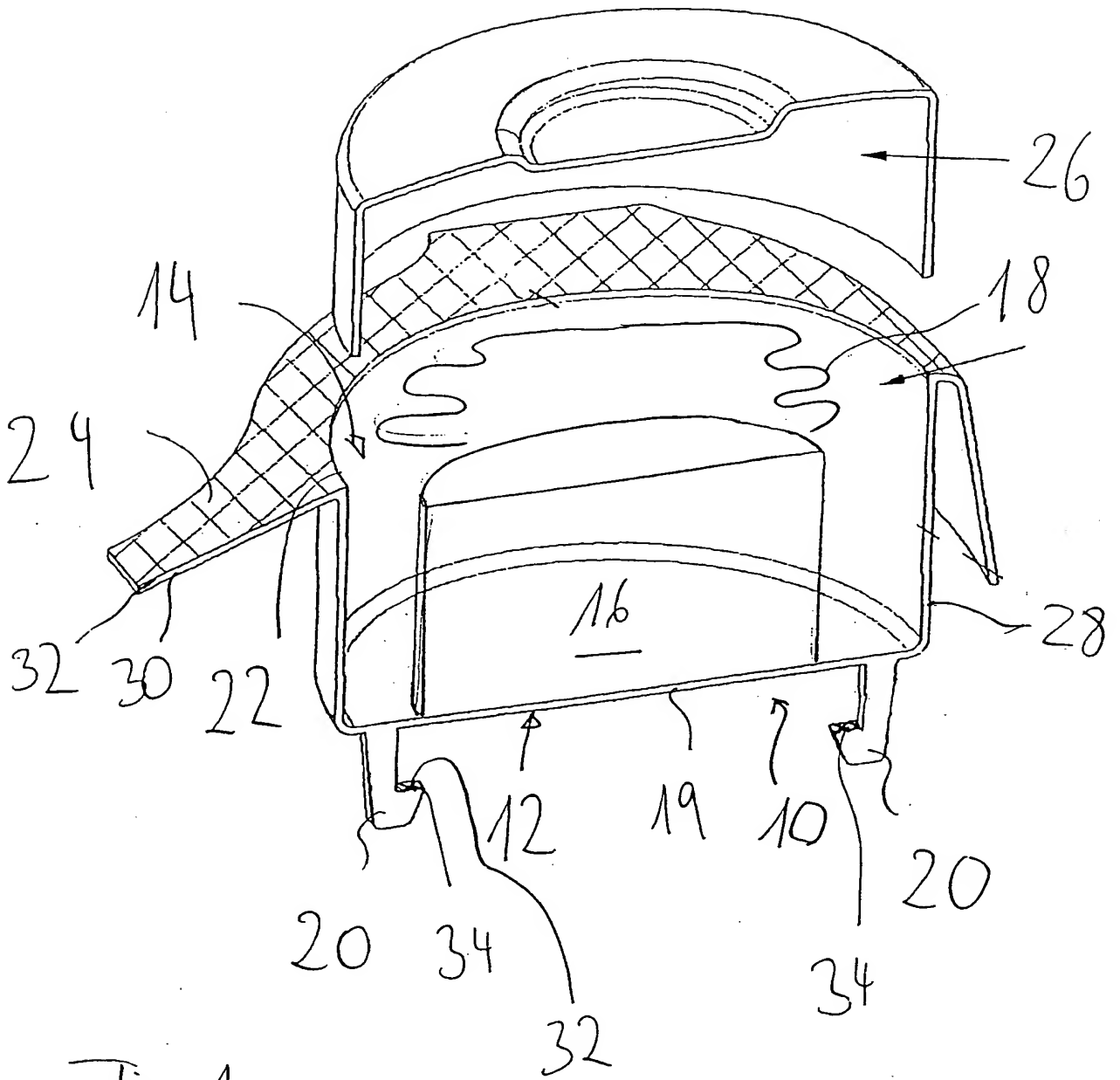


Fig. 1

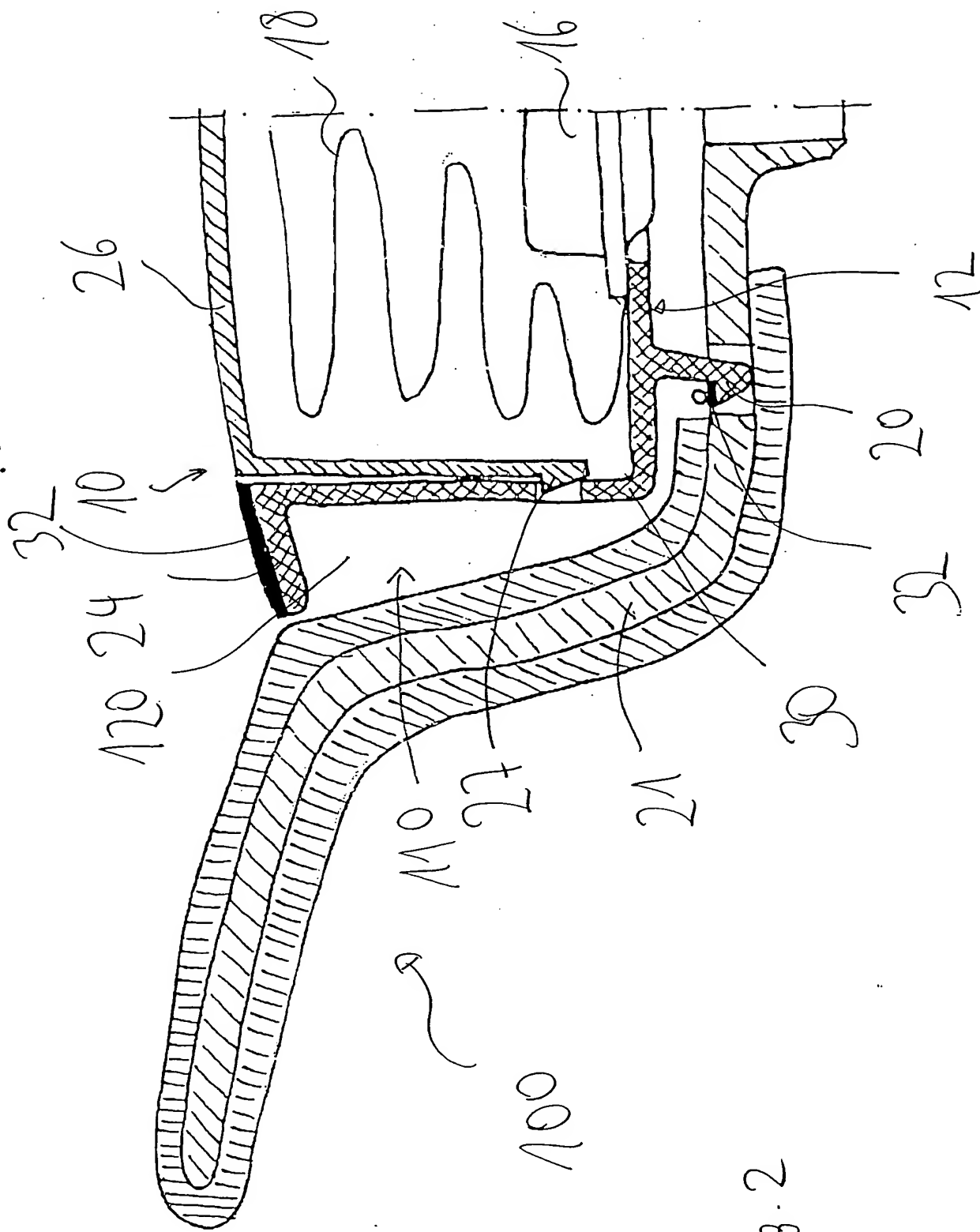


Fig. 2